



## How Technology Can Defuse the Demographic Time Bomb



By Eduardo Rodriguez-Montemayor , Senior Research Fellow of Economics at INSEAD

**As people live longer and working age populations face hardship, technology could help ease the growing dependency burden.**

Society is currently faced with two converging phenomena. On the one hand, rapidly ageing populations are supported by a shrinking working age population. On the other, those in work are increasingly being **replaced by machines** as result of the technological revolution. Yet these subjects are rarely discussed together, which is surprising given that technology has important implications for work and employment and the problem of old-age dependency is, as a matter of fact, a problem of work and production. As a larger pool of retirees consumes without “producing”, the burden on pension and protection systems rises.

Today, there are 28 older people (over 65) for every 100 people of working age (18-64) across the **OECD countries**. In 2050, there are expected to be

51 elderly per 100 of working age. This seems to imply that the problem is a relative "scarcity" of working-age people compared to retirees. If that was the case, automation of some work would be good news. The dependency problem, however, is more complex and goes beyond the young-old dichotomy. Although it is true that older people are more likely to be inactive and claim social benefits, technological developments make these numbers misleading.

There is emerging evidence that older people, who are living longer and healthier (thanks to medical innovations) are embracing technology to engage in additional work, thus contributing to the economy even if some receive a pension.

## **Gerotechies**

According to the [Pew Research Center](#), seniors continue to lag behind younger Americans when it comes to technology adoption. And many seniors remain largely detached from online and mobile life – particularly those over 75. Yet, there has been some progress. In April 2012, for the first time more than half of adults 65 or older were internet users. In 2016, 59 percent of seniors reported that they go online – a six-percentage point increase in the course of a year – and 47 percent say they have a high-speed broadband connection at home.

In fact, higher-income and more highly educated seniors use the internet and broadband at rates approaching – or even exceeding – the general population. Recent evidence also suggests that it is [mainly older workers](#) who are turning to online platforms to engage in alternative work. If this is true, older people would have the option to have gradual retirement patterns (by keeping work flexibility) while they continue contributing to society, thus reducing dependency.

Furthermore, advancements in healthcare are giving seniors greater independence. It is no longer farfetched to suggest that artificial intelligence and robots can help look after the frail elderly, thus easing the care of an increasing amount of dependent people (there is a specific area of research on "gerontechnology").

## **The vulnerable young**

Dependency not only means having more disabled or frail elderly. An ageing society consumes differently and such consumption will be difficult to sustain if productivity in the economy does not increase.

In recent years, productivity has experienced a slowdown even in the context of rapid technological change. And when productivity has increased, employment has not kept up. Some working-age people remain unemployed and their **wages stagnant**. This makes us wonder whether the problem of dependency is really one of a shortage of younger workers. If more working-age people (mainly low-skilled) become unemployed due to automation, dependency will become more widespread and affect more segments of society.

While automation would compensate for any potential “shortages” of young workers relative to the increasing number of retirees to be supported, it could also worsen the plight of the young, particularly the low-skilled. Contrary to the common assumption that younger workers will have the best chance at avoiding technological redundancy, Jeffrey Sachs and Laurence Kotlikoff propose that the impact of technological unemployment will likely be **borne most heavily by younger workers** with fewer accumulated skills, leading to an intensification of the current inequality between relatively affluent seniors and struggling young and middle-aged people.

### **The way out of dependency**

Dependency will be re-shaped by how available skills match the needs of the evolving economy. Technology could help produce the goods and services demanded by an ageing society either by automating production (thus offsetting the apparent labour shortage) or by improving the availability of and access to the skills needed to provide such services.

Connectedness and new work models empowered by technology are enabling excess capacity in societies (e.g. time and interest) to be deployed in sectors that need workers. Ageing societies require more people employed in community, social and personal services. The health care sector faces pressing financial and human resource challenges. In that context, a **start-up company** founded by an INSEAD alumnus works from an Uber-type model in China, letting people with spare time provide care to frail elderly, sometimes in addition to their regular employment.

Technology has, therefore, a good chance of overcoming the dependency challenge by allowing people, both younger and older, to work more efficiently and to produce more economic value. An increased economic contribution of older people would create a “longevity dividend”. Having older people extend their careers would be good for the economy and good for them (in terms of their psychological health and sense of belonging).

There are two challenges. One is institutional. Life expectancy keeps increasing while the institutional setting in many countries leads many people who are still productive to **retire from labour markets** – many times at an arbitrary age like 65. Reforming some of the parameters of eligibility and benefits of programmes such as Social Security and pension systems can help create the right incentives for people to continue working.

The other challenge is whether an older society would be able to adapt to the technological revolution. Some researchers claim that physiological degeneration in the connections between cells in the brain’s frontal lobe means that older people are less able to solve certain problems – and thus the complexities brought by technology and connectedness would be more difficult to handle. Other research claims that older people show more inertia when it comes to doing things differently, which rapid technological change demands.

If older people fail to adapt to new technologies and re-invent themselves, their skills could become outdated and they will be forced to remain inactive. Early retirement just makes the dependency problem worse.

## **Policies of the 21<sup>st</sup> Century**

The problem is one of skills. Technology complements the work of some people (mainly those with high skills) whereas it replaces the jobs of others. Automation could increase the dependency of low-skilled workers who become unemployed.

Leading economists have recently suggested that smart machines could even make whole future generations worse-off if the appropriate (generational) policies are not in place. The question is how to share the extra national income created by technology and overcome emerging inequalities. Policy changes will have to go beyond ‘old-age’ policies and tackle generational issues that also affect the young. Employment policy, for instance, should adapt to new work models (e.g. contingent work) that differ

from typical full-time employment. Discussions about the desirability of a **universal basic income** are gaining momentum in the context of increasing inequalities. A new social contract may be needed in order to share the technological dividend.

***Eduardo Rodriguez-Montemayor***, is a Senior Research Fellow in INSEAD's Economics and Political Science Department and is the Lead Researcher of the ***Global Talent Competitiveness Index***.

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### About the author(s)

**Eduardo Rodriguez-Montemayor** Eduardo Rodriguez-Montemayor is part of the Economics Department at INSEAD and a Senior Research Fellow of INSEAD's European Competitiveness Initiative.

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